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# Chemical imaging of biological materials by NanoSIMS

P. K. Weber, J. B. Smith, I. D. Hutcheon

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## Chemical imaging of biological materials by NanoSIMS

Peter K. Weber, Julie B. Smith, Ian D. Hutcheon

Chemical Biology and Nuclear Science Division, L-231, P.O. Box 808, Lawrence  
Livermore National Laboratory, Livermore, CA 94550 USA

The NanoSIMS 50 represents the state -of-the-art for *in situ* microanalysis for secondary ion mass spectrometry (SIMS), combining unprecedented spatial resolution (as good as 50 nm) with ultra-high sensitivity (MDL of 200 atoms). The NanoSIMS incorporates an array of detectors, enabling simultaneous collection of 5 elements or isotopes originating from the same sputtered volume of a sample. The primary ion beam ( $\text{Cs}^+$  or  $\text{O}^-$ ) can be scanned across the sample to produce quantitative secondary ion images. This capability for multiple isotope imaging with high spatial resolution is unique to the NanoSIMS and provides a novel new approach to the study of the distribution of elements in biological materials. We have applied this technique extensively to mammalian cells and bacterial spores. Results from these studies and critical analytical issues such as sample preparation, instrument tuning, and data processing will be discussed.